

Inverted Bucket Steam Traps

SERIES E

Inverted Bucket Steam Traps belong to the family of mechanical traps. They operate on the difference in density between steam and water. MIYAWAKI offers a very wide range of inverted bucket steam traps for small up to large condensate loads. Inverted bucket steam traps discharge the condensate intermittently.

Models ER	Cast Iron Inverted Bucket Steam Traps for medium up to high condensate loads
ES	Cast Iron Inverted Bucket Steam Traps for small up to medium condensate loads
ESH, ER25	Cast Steel Inverted Bucket Steam Traps for high pressure and small up to high condensate loads
ESU	Stainless Steel Inverted Bucket Steam Traps for small up to medium condensate loads

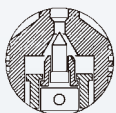
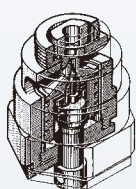
Features

- All traps are equipped with stainless steel wear and corrosion resistant lever, valve and seat system for long and troubleless life.
- All valves and seats are lapped together.
- Traps of the series E contain the patented SCCV® (Self Closing and Centering Valve) – System, which increases the lifetime of the valve and seat substantially.
- A small hole in the top of the bucket secures continuous automatic air venting.
- All traps are designed for quick and easy inline repairability.
- Withstands high back pressure (up to 90%).

Application

Heat exchangers, dryers, unit heaters, sterilizers and other applications, where condensate must be removed immediately

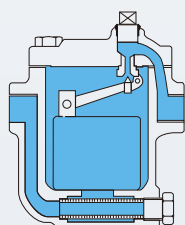
Super-Discharger



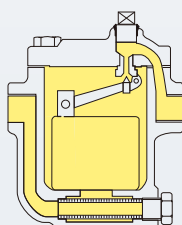
1. Incorporates the **MIYAWAKI SCCV®**-System (see pages 88 – 89)
2. Double valve system with needle pilot valve and main valve (for ER Type)
3. Operates by the pressure difference inside the valve unit
4. Makes the discharge capacity very large
5. Designed for high pressure up to 6,4 MPa (925 psig) – only for ER25

Operating principle

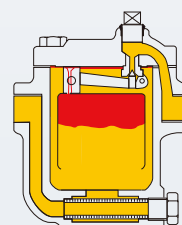
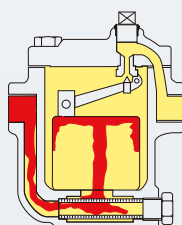
■ cold condensate ■ hot condensate ■ steam



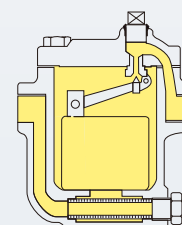
1 & 2



3 & 4



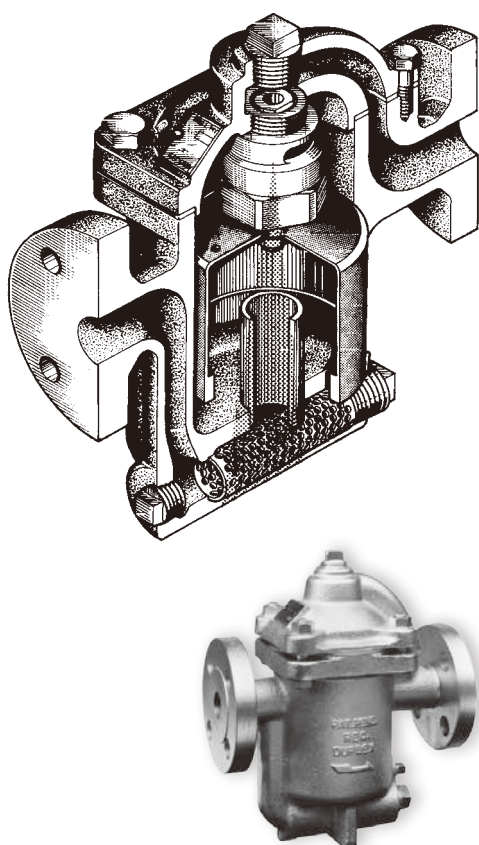
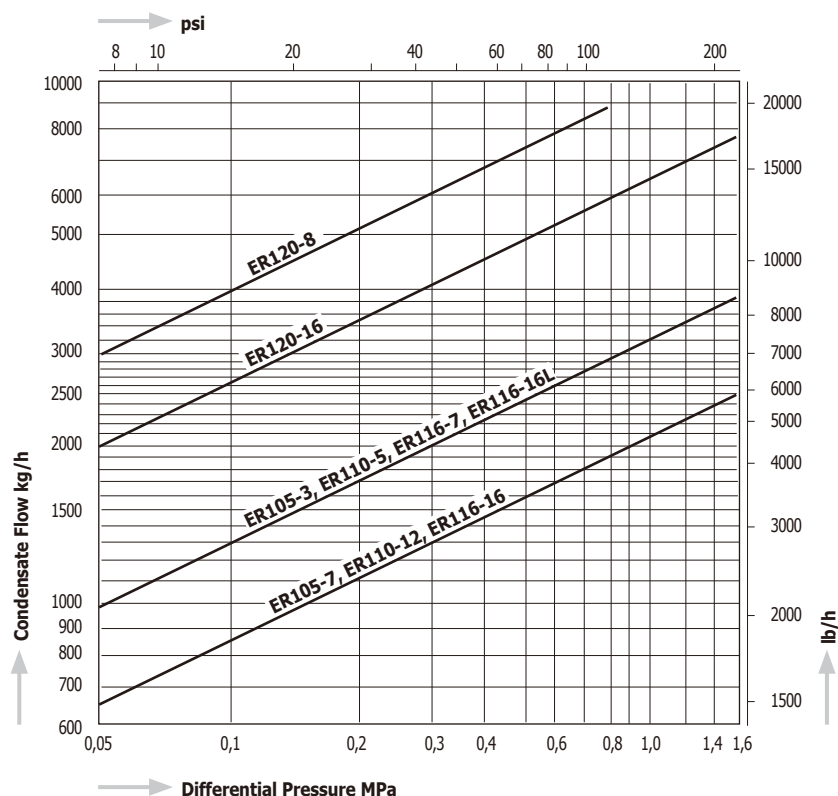
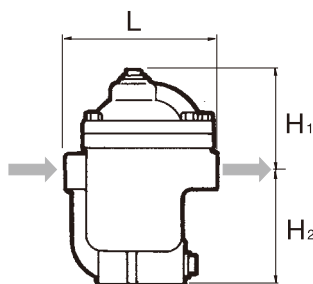
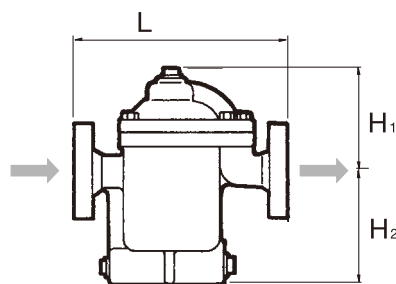
5 & 6



On start-up the bucket is down and the valve is open. Low temperature condensate and air, later high temperature condensate enter the trap. The condensate fills the bucket and the trap body completely. As the bucket is completely submerged in the water, it lies on the bottom of the trap, the valve is wide open and condensate will discharge.

Steam enters the trap under the bottom of the bucket. The more steam is entering the trap, the more it collects at the top of the bucket, causing the bucket to move upwards (buoyancy of the bucket inside the water). At the top position of the bucket the valve will close the seat.

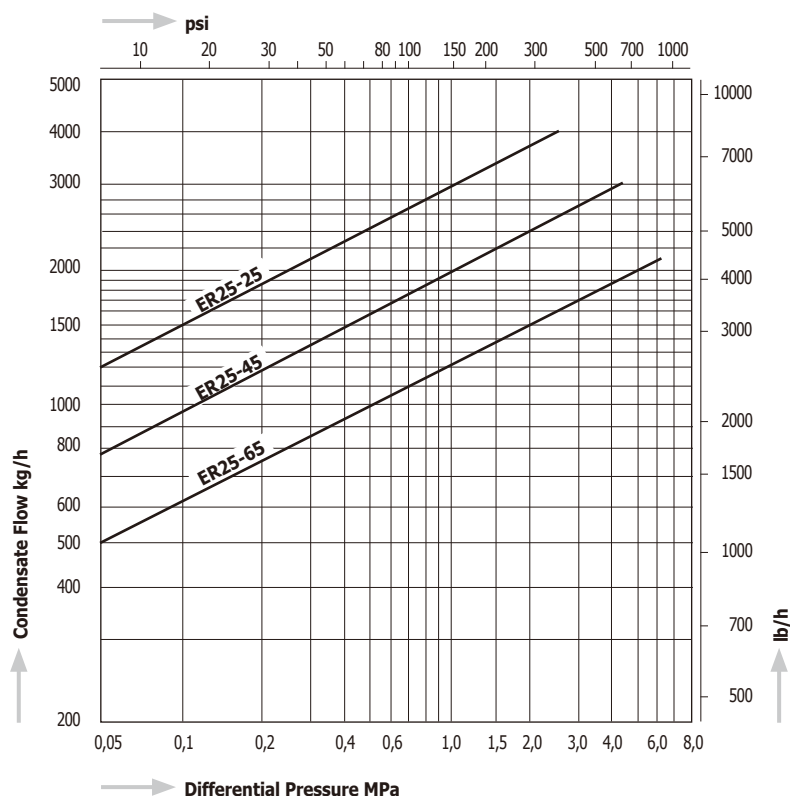
Air and gases pass through a small hole in the top of the bucket and collect at the top of the trap. Steam is also passing through the hole and condensing. When more condensate is entering the trap, the bucket will lose its buoyancy and will move down. The valve will open and condensate will discharge.

ER**Capacity Chart ER****Dimensions****ER105****ER105F, ER110, ER116, ER120**

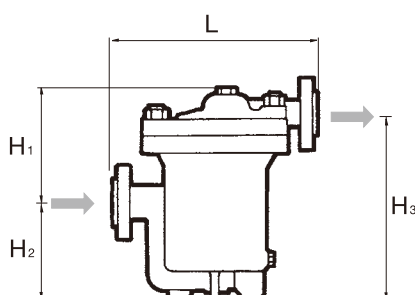
Model	Connections	Size	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)			Dimensions (in)			Body Material	Weight	
			MPa	psig	°C	°F	L	H ₁	H ₂	L	H ₁	H ₂		kg	lb
ER105 - 3 7	Screwed Rc, NPT	3/4" – 1 1/2"	0,3	43	220	428	190	155	134	7.5	6.1	5.3	Cast Iron FC250	10,2	22.5
			0,7	100			254	155	134	10.0	6.1	5.3		13,6	29.9
ER105F - 3 7	Flanged JIS, ASME, DIN	1/2" – 1"	0,3	43			260	155	134	10.2	6.1	5.3		15,1	33.2
		1/2" – 1"	0,7	100			254	155	134	10.0	6.1	5.3		13,6	29.9
		1 1/4" – 2"	0,7	100			260	155	134	10.2	6.1	5.3		15,1	33.2
		1 1/4" – 2"	0,7	100			260	155	134	10.2	6.1	5.3		15,1	33.2
ER110 - 5 12	Flanged JIS, ASME, DIN	1/2" – 1"	0,5	73			254	200	140	10.0	7.9	5.5	Ductile Cast Iron FCD450	16,1	35.4
		1 1/4" – 2"	0,5	73			280	210	130	11.0	8.3	5.1		18,1	39.8
		1/2" – 1"	1,2	174			254	200	140	10.0	7.9	5.5		16,1	35.4
		1 1/4" – 2"	1,2	174			280	210	130	11.0	8.3	5.1		18,1	39.8
ER116 - 7 16	Flanged JIS, ASME, DIN	1/2" – 1"	0,7	100	300	572	300	230	132	11.8	9.1	5.2		19,0	41.8
		1 1/4" – 2"	0,7	100			300	190	167	11.8	7.5	6.6		23,0	50.6
		1/2" – 1"	1,6	230			300	230	132	11.8	9.1	5.2		19,0	41.8
		1 1/4" – 2"	1,6	230			300	190	167	11.8	7.5	6.6		23,0	50.6
ER120 - 8 16	Flanged JIS, ASME, DIN	1 1/2" – 2 1/2"	0,8	116	220	428	400	220	217	15.8	8.7	8.5	Cast Iron FC250	46,0	101.2
			1,6	230			400	220	217	15.8	8.7	8.5		46,0	101.2

ER25

Capacity Chart ER25



Dimensions ER25

*** Available options ER25**

Max. operating temperature 470°C (878°F)
with body material WC6

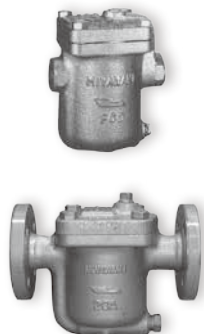
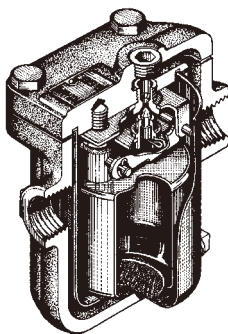
Table 1: Dimensions

Size	Flange Standards				L (mm)	L (in)
½" – 1" (DN15 – 25)	JIS 10 – 40 K	ASME 150 lb / 300 lb RF	DIN PN40		340	13.4
	ASME 600 lb RF	ASME 150 – 600 lb RJ	DIN PN63 / PN100 (DN15 / DN20)		345	13.6
	JIS 63 K	ASME 900 lb RF / RJ	DIN PN63 / PN100 (DN25)		380	15.0
1¼" – 2" (DN32 – 50)	JIS 10 – 40 K	ASME 150 – 600 lb RF / RJ	–		380	15.0
	JIS 63 K	ASME 900 lb RF / RJ	DIN PN40 / PN63 / PN100		400	15.8

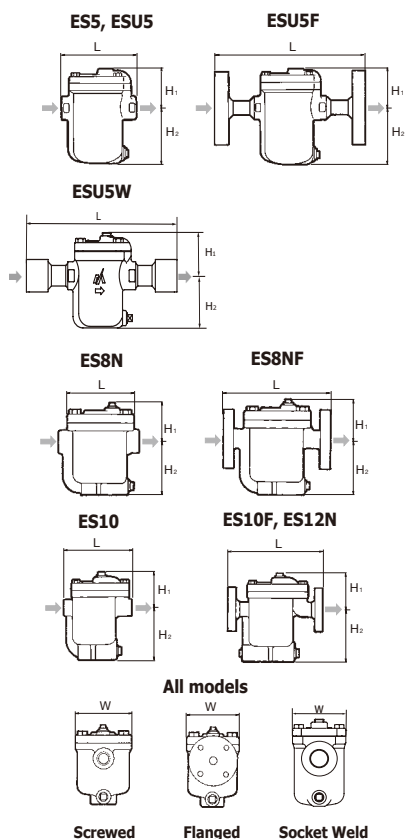
Model	Connections	Size	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	L	H ₁	H ₂	H ₃	L	H ₁	H ₂	H ₃		kg	lb
ER25 - 25	Flanged JIS, ASME, DIN	½" – 2"	2,5	360	425*	800	Table 1	210	180	345	Table 1	8.3	7.1	13.6	Cast Steel SCPH2	½" – 1" 51	112.2
			4,4	640												1¼" – 2" 58	
			6,4	925													
ER25W - 45	Socket Weld JIS, ASME, DIN	½" – 2"	2,5	360	425*	800	½" – 1½" 340	210	180	345	½" – 1½" 13.4	8.3	7.1	13.6	Cast Steel SCPH2	48	105.6
			4,4	640													
			6,4	925													

Stainless Steel as body material is available as special design. For more details, please contact MIYAWAKI Inc. or an authorized representative.

ES



Dimensions

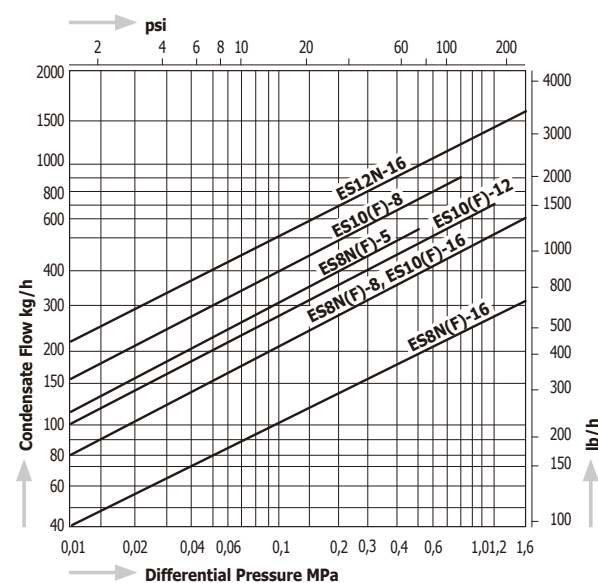
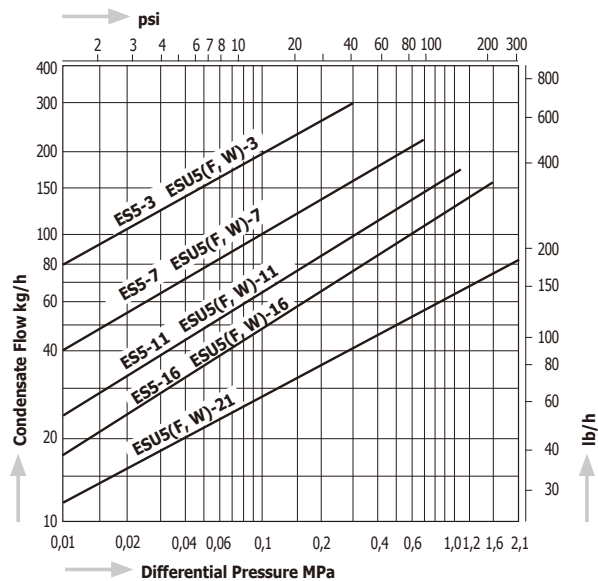


Available options

Depending on the Maximum Operating Pressure the following models are available:

Max. Operating Pressure		
Model	MPa	psig
ES5 - 3	0,3	43
ES5 - 7	0,7	100
ES5 - 11	1,1	160
ES5 - 16	1,6	230
ESU5 - 3	0,3	43
ESU5 - 7	0,7	100
ESU5 - 11	1,1	160
ESU5 - 16	1,6	230
ESU5 - 21	2,1	305
ES8N - 5	0,5	73
ES8N - 8	0,8	116
ES8N - 16	1,6	230
ES10 - 8	0,8	116
ES10 - 12	1,2	174
ES10 - 16	1,6	230

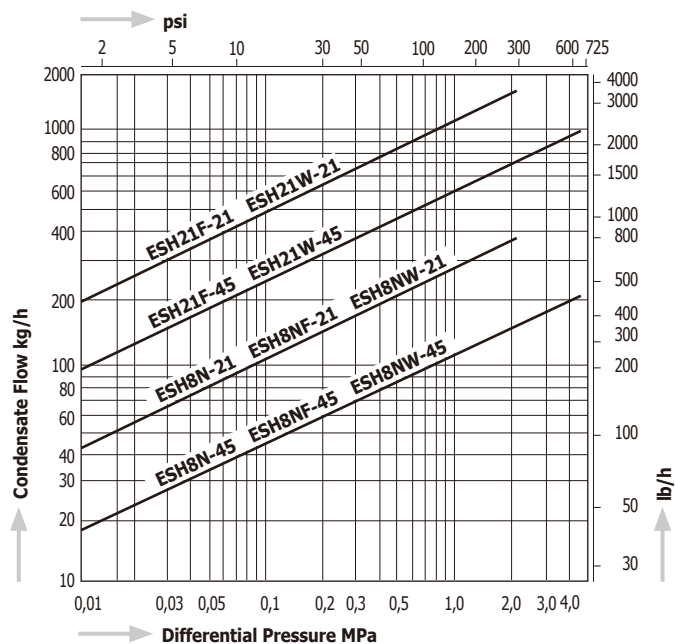
Capacity Chart ES



Model	Connections	Size	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight				
			MPa	psig	°C	°F	L	H ₁	H ₂	W	L	H ₁	H ₂	W		kg	lb			
ES5	Screwed Rc, NPT	½"	1,6	230	350	662	103	59	67	75	4.1	2.3	2.6	3.0	Ductile Cast Iron FCD450	1,9	4.2			
		¾"					105	57	69		4.1	2.2	2.7			1,9	4.2			
		1"					109				4.3					2,0	4.4			
ESU5	Screwed Rc, NPT	½"	2,1	305			103	57	69	75	4.1	2.2	2.7	3.0	Stainless Steel SCS13A	1,9	4.2			
		¾"					105				4.1					2,0	4.4			
		1"					109				4.3					2,1	4.6			
ESU5F	Flanged JIS, ASME, DIN	½"	2,1	305			175	57	69	75	6.9	2.2	2.7	3.0		3,5	7.7			
		¾"					195				7.7					3,7	8.2			
		1"					215				8.5					4,1	9.0			
ESU5W	Socket Weld JIS, ASME, DIN	½"	2,1	305			203	57	69	75	8.0	2.2	2.7	3.0		2,5	5.5			
		¾"					230				9.1					2,6	5.7			
		1"					254				10.0				2,8	6.2				
ES8N	Screwed Rc, NPT	½"	1,6	230			350	662	130	73	90	100	5.1	2.9	3.5	3.9	Ductile Cast Iron FCD450	3,7	8.2	
		¾"							135				5.3					3,9	8.6	
		1"							175				73					90	6.9	2.9
ES8NF	Flanged JIS, ASME, DIN	½"	1,6	230					195	68	95	100	7.7	2.7	3.7	3.9		5,7	12.5	
		¾"			215	8.5			6,8				15.0							
		1"																		
ES10	Screwed Rc, NPT	¾" – 1½"	1,6	230	220	428			190	102	134	120	7.5	4.0	5.3	4.7		Cast Iron FC250	9,3	20.5
ES10F	Flanged JIS, ASME, DIN	½" – 1"							254	102	134	120	10.0	4.0	5.3	4.7			12,7	28.0
		1¼" – 2"					260	10.2	14,2				31.2							
		½" – 1"	270	140			140	10.6	5.5				5.5				13,5		29.7	
		ES12N	Flanged JIS, ASME, DIN	1¼" – 2"			1,6	230	280	150	130	120	11.0	5.9	5.1	15,1	33.2			

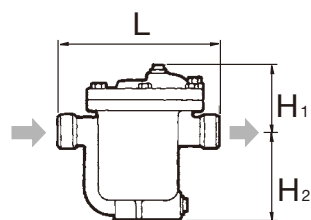
ESH

Capacity Chart ESH

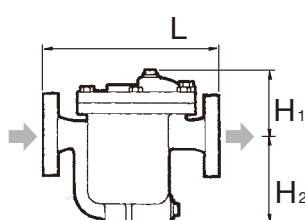


Dimensions

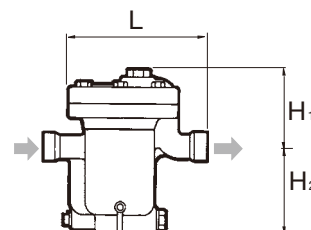
ESH8N, ESH8NW



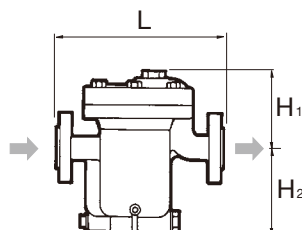
ESH8NF



ESH21W

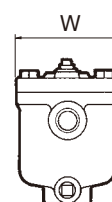


ESH21F

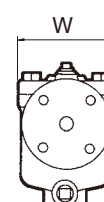


All models

Screwed, Socket Weld



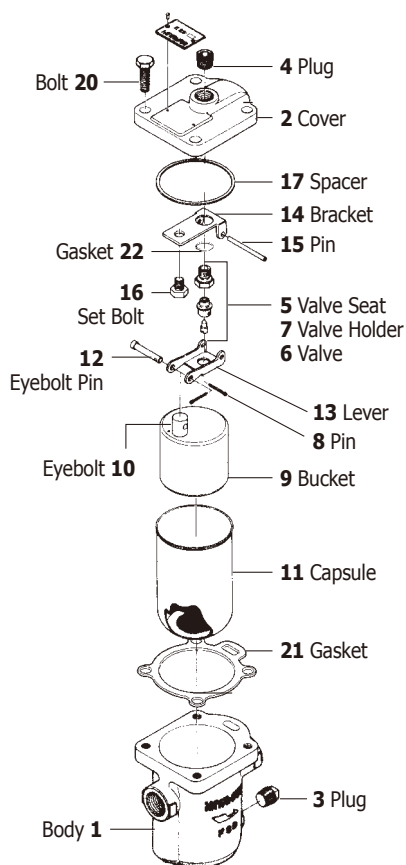
Flanged



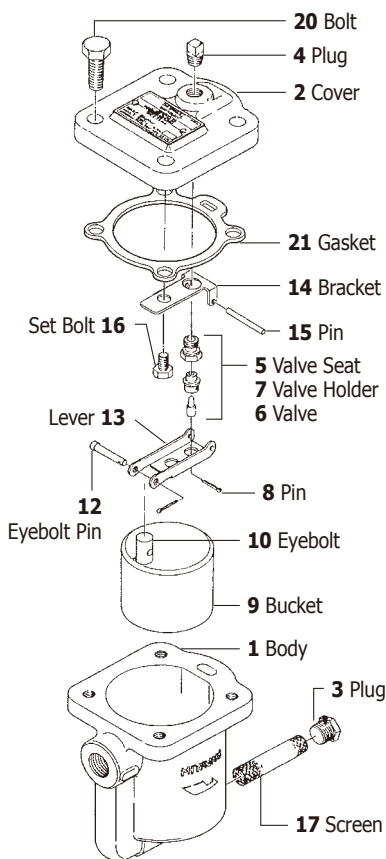
Model	Connections	Size	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	L	H ₁	H ₂	W	L	H ₁	H ₂	W		kg	lb
ESH8N - 21 45	Screwed Rc, NPT	½" – 1"	2,1	305	400	752	½" – ¾" = 220 1" = 224	114	111	146	½" – ¾" = 8.7 1" = 8.8	4.5	4.4	5.7	Cast Steel SCPH2	11,0	24.2
			4,4	640													
ESH8NF - 21 45	Flanged JIS, ASME, DIN	½" – 1"	2,1	305			250	114	111	146	9.8	4.5	4.4	5.7		½", ¾" = 12,3 1" = 13,1	27.1 28.8
			4,4	640													
ESH8NW - 21 45	Socket Weld JIS, ASME, DIN	½" – 1"	2,1	305			220	114	111	146	8.7	4.5	4.4	5.7		11,0	24.2
			4,4	640													
ESH21F - 21 45	Flanged JIS, ASME, DIN	½" – 1"	2,1	305			350	145	160	205	13.8	5.7	6.3	8.1		31,0	68.2
			4,4	640													
ESH21W - 21 45	Socket Weld JIS, ASME, DIN	½" – 1"	2,1	305			300	145	160	205	11.8	5.7	6.3	8.1		28,0	61.6
			4,4	640													

Stainless Steel as body material is available as special design. For more details, please contact MIYAWAKI Inc. or an authorized representative.

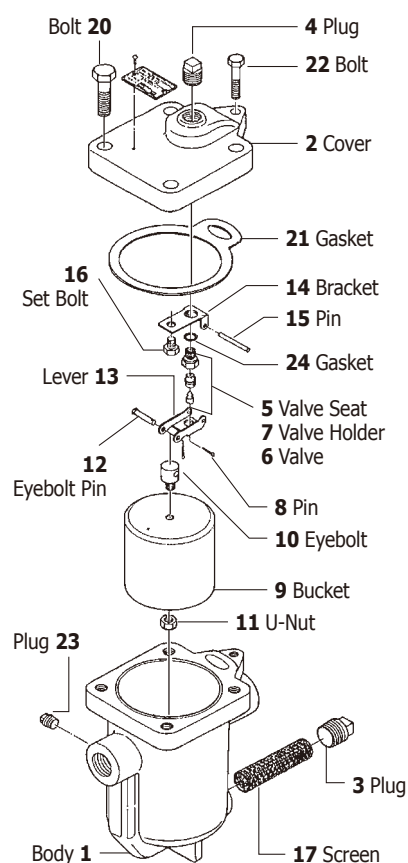
ES5/ESU5



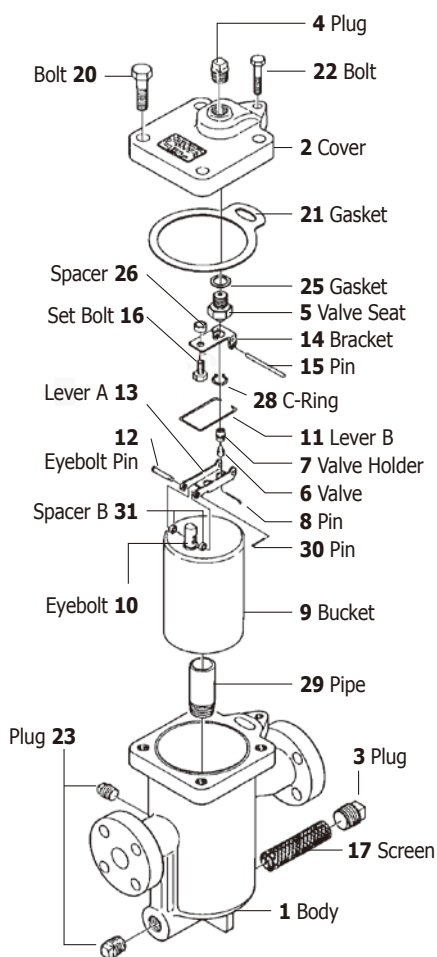
ES8N



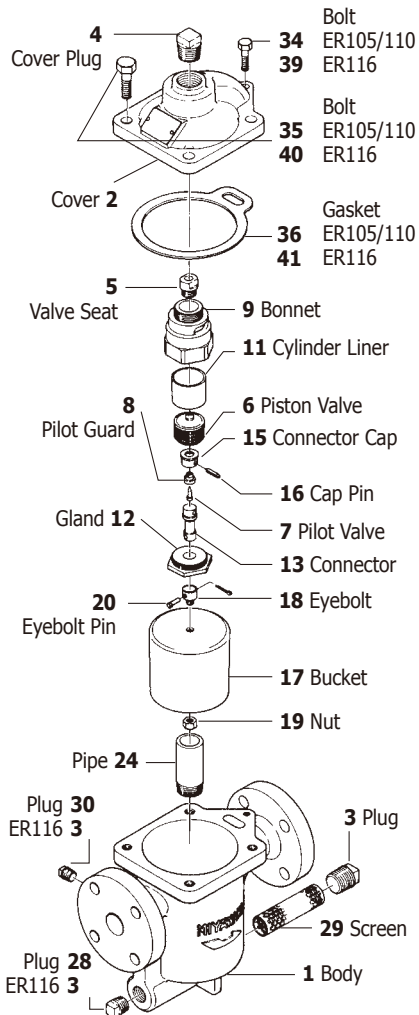
ES10



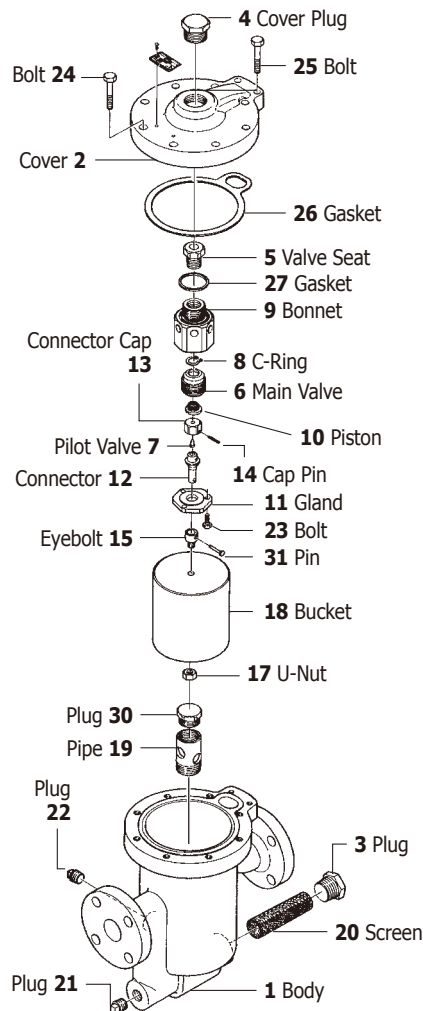
ES12N



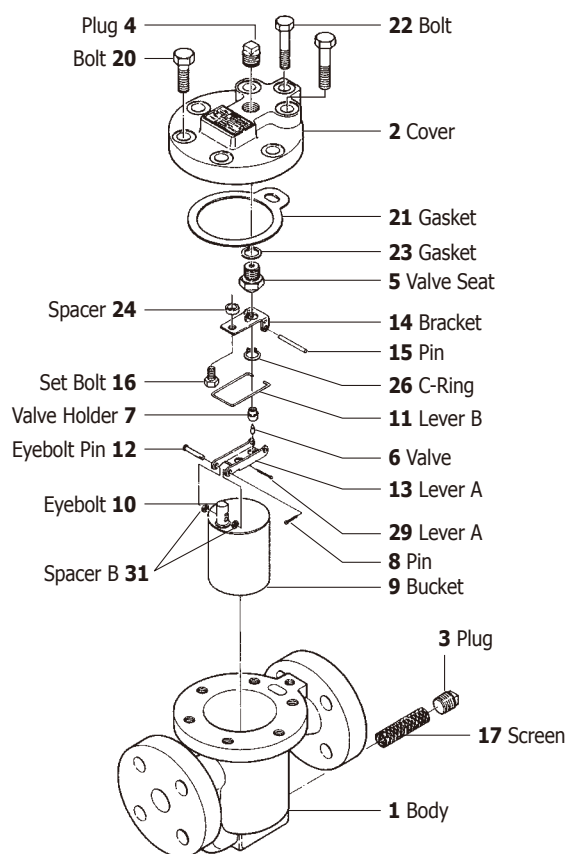
ER105/110/116



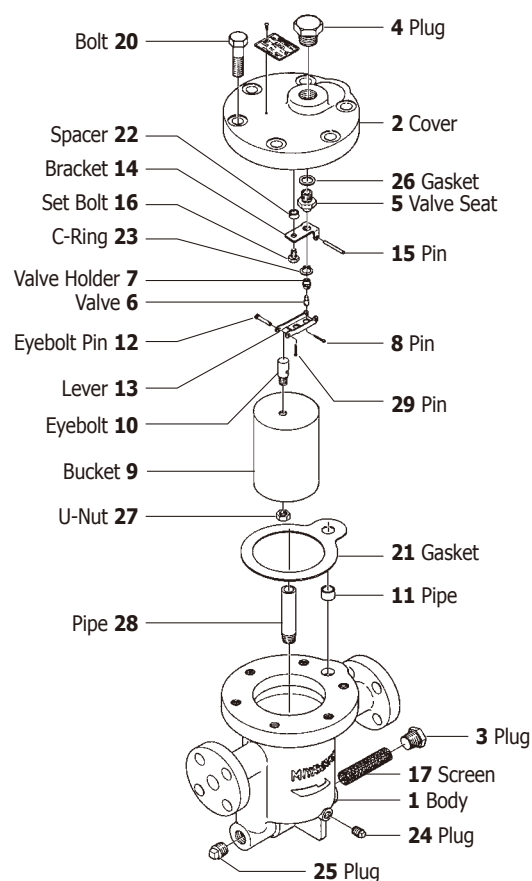
ER120



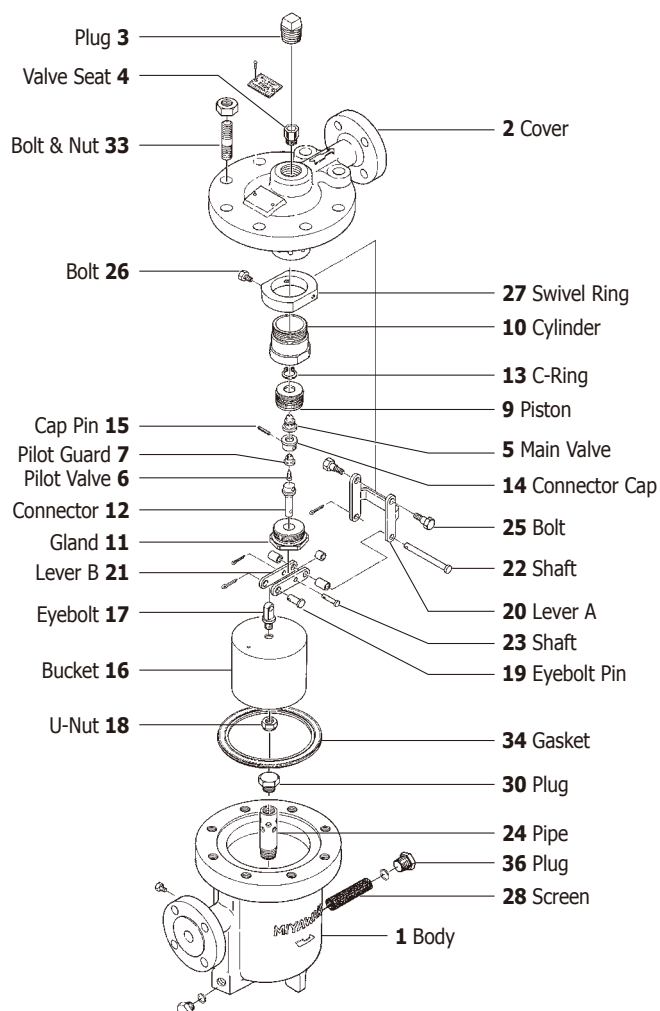
ESH8N



ESH21



ER25



[illegible]